THE

YOUNG MECHANIC.

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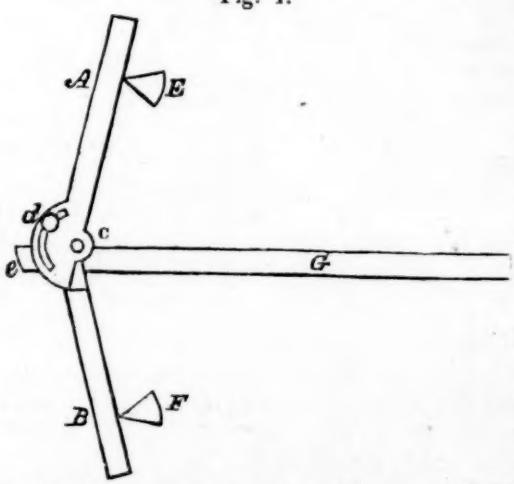
OBSERVATIONS ON DRAWING INSTRUMENTS.

[Continued from p. 115.]

OF OTHER INSTRUMENTS FOR DRAWING AND DIVIDING CIRCLES.

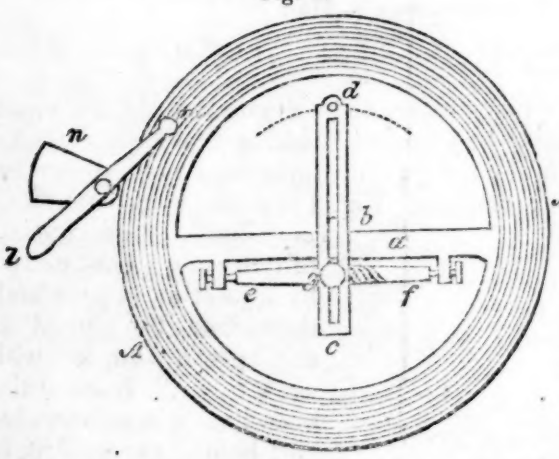
IT frequently occurs that circles are to be drawn the radii of which are so long that they cannot be comprehended in the beam compasses. To accomplish this many instruments have been constructed, of which the following is a description. Fig. 1 is called a *cyclograph* or *curvilinead*, and consists of two rulers A. B. united by a joint at c, by which they may be placed at any given angle with each other. Each at the end has a semi-circular part behind the centre, in the upper of which is a groove for the reception of the screw *d*, which is tapped into the lower one, and by screwing this tight the two may be clamped together so as to be immovable at any angle at which they may be set. The centre pin of the joint c is formed like a tube having a hole perforated through it for the reception of an ink or pencil point, and in such a position that its point is in the intersection of the edges of the two rulers A B. To use the instrument the two weights E F, are laid upon the table, and the angular edges applied against the rulers, as shown in the figure, and it being slid against them, the point in the joint c describes the arc of a circle. Two pins or needles would answer the same purpose as the weights, and are often used instead of them. The weights have each, three very small pins on the underside, which stick into the paper and prevent them from slipping. The instrument will draw an arc of a circle of any

Fig. 1.



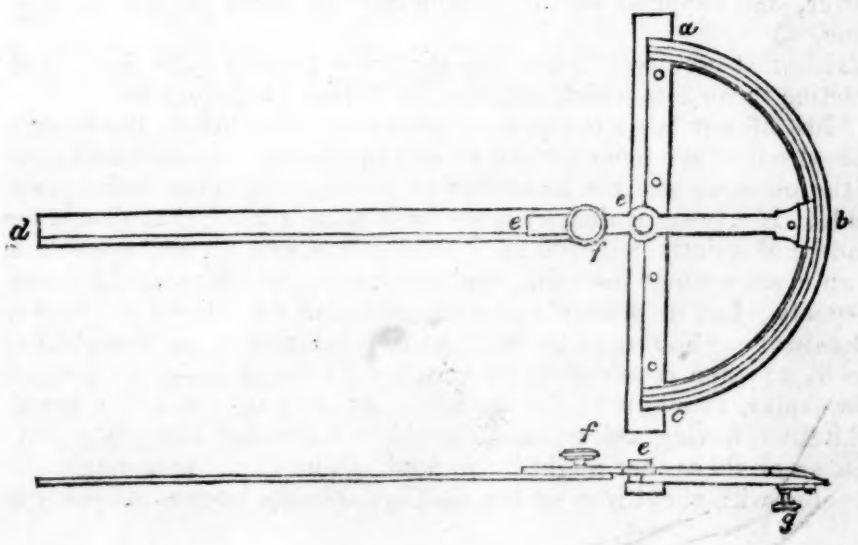
required radius by altering the angle of the rulers. The mode of adjusting it is very simple. First, mark on the paper two points which are to be the extremes of the intended arc, then having drawn the chord and its versed sine, we have given three points in the curve. Fix two pins or the weights to the two points, and apply the instrument to them. Open the angle of the rulers till the pen at the vertex coincides with the point c, fasten them by the screw, and by sliding the instrument against the pins, the pen will describe upon the paper the proper curve. Another ruler G is sometimes attached to this instrument, and converts it into the *centrolinead*, which is used for drawing lines to a point or centre, situated at a great distance from the paper, and is extremely convenient for drawing vanishing lines in angular perspective. It turns on the centre c, and is set in any positon by the clamp screw, *e*. Fig. 2 is an instrument for dividing circles into a great number of equal parts, which is very useful for laying out the teeth of wheel work, and for many other purposes. A A is a brass circle having a cross-bar *a* immediately behind the centre, in which is fixed a screw *b*, with the end formed to a small point which enters the paper, making a small puncture and on which the circle revolves. The instrument has several circles described on it, which are accurately divided by an engine, holes being drilled through the plate at any division. The number of these circles is not fixed; but eight will generally be found sufficient, each containing a different number of holes or divisions; thus the outer one may be 360, then 100, 96, 90, 84, 72, or it may be divided to suit the fancy of the artist. An index *cd*, containing a steel point in the end, for transferring the divisions to the paper at any radius, is attached to an axis *ef*, by means of a thumb screw *g*. When the screw is loose, the index having a slit or groove in it, can be moved so as to bring the marking point nearer or father from the centre, according to the radius of the curve to be divided. The ends of the axis *ef*, are supported upon the points of two screws which pass through the projections in the bar *a*. A small spiral spring is twisted around the axis, one end being secured to it, and the other, to the slider at the centre of the bar. This, by its tendency to expand, raises the marking point from the paper as every division is pricked off; *n* is a flat piece of brass, on the underside of which are three small pins for confining it to the paper, and which

Fig. 2.



is held down by the fingers. A steel spring *lm*, is supported upon the end of the piece of brass *n*, having in its end a small detent or pin which enters the holes or divisions as they pass in succession beneath it, when the circle is turned round. The manner of using the instrument is this. Place the centre point on the centre of the circle to be divided, then loosen the screw *g*, and push forward the index until the marking point in the end touches the circumference of the circle, and fasten the thumb screw tight. Now, placing the piece of brass *n* in a convenient position beside the circle, drop the detent in the end of the spring into one of the holes of the circle containing the proposed number of divisions, holding the piece of brass down by placing the second finger of the left hand upon it. The thumb of the same hand is to be placed on the rim of the circle, to move it during its revolution, and the fore finger on the tail of the spring for the purpose of raising it out of the divisions. The fore finger of the right hand is to press on the screw *b* to make the indentations on the paper, and in this way the circle may be divided very quickly with as great accuracy as it is possible to obtain on paper. The *protractor* is used for laying down angles, or for ascertaining the number of degrees in any given angles. There are three kinds, the *circular* or full circle, the *semi-circular* and the rectangular, the latter having its divisions made on the chamfered edge of a rule, and which are derived from the circle, and is made in this form, merely for convenience The *circular* protraction, is divided into 360 equal parts or degrees, which are numbered at every tenth degree each way from right to left and from left to right. The *semi-circular* protractor is similar to the former in every respect, except it is but half a circle. The protractor has sometimes connected to it a steel tongue like the blade of a bevel, it being used for plotting surveys, &c. A very beautiful instrument of this kind is made by Alexander Megary of New York. Fig. 3 is a representation of it.

Fig. 3.



A b c, is a semi-circle of brass, having a bar *b e* of the same metal turning on a pin in the centre *e*. This bar has a verneer at *b* and a screw *f*, for confining the steel ruler *f d* to it, which may be taken off for the purpose of packing in a box. A screw *g* is for clamping the bar in any position on the semi-circle. *Protractors* are frequently made of horn on account of its transparency, but as they are very liable to warp they should be put into a book when not in use. An explanation of every method of using the protractor would be supurfluous, as the very sight of the instrument conveys to the mind at once the intention of it. The particular application must be left entirely to the artist, who after a little practice will make himself perfectly familiar.

HINTS ON THE ECONOMY OF HEAT,

AND ON REDUCING THE CHANCES OF HOUSES BEING BURNT.

MANY distressing cases of fire are known to originate from stove pipes, and flues of furnaces; also from sparks coming in contact with wearing apparel, and other combustible substances. Now, if the number of stoves and fire places could be greatly reduced, a corresponding diminution of these conflagrations would necessarily be the consequence.

The question which naturally suggest itself, is, how can we dispense with our stoves and fire places? I answer, pull down your chimneys, and place them under your streets in a horizontal position, three feet or more below the surface of the ground, there let them serve as conduits for hot air. The air may be heated at an establishment located near some navigable canal, or good land conveyance, where fuel can be had at the cheapest rate; let the air be taken from the most healthy spot, heated, and forced along these subterraneous tubes, by a steam-engine or other adequate power, and supplied to the inhabitants as water or gas is now done.

The next inquiry will be, how shall we prepare our food, and practice those arts which require fire in that performance?

Most of our large towns have grown up by degrees; the houses and streets have been formed to suit the tastes or circumstances of the owners; and not according to any general plan judiciously made. If a town or district were built upon a plan, that should be made and strictly adhered to, I think it possible to make such a town more exempt from fire, and much more economical in other respects. Let us picture to ourselves a plan for a town as follows. The dwelling houses to be built without chimneys or fire places; the heat, when required, to be supplied by the town, or by private companies, as might be found best. At the back of every house a kitchen, having a fire place, should be built, and any other out-houses or sheds that might be wanted. The back door might be covered with sheet iron on the side towards the kitchen, to prevent

the fire communicating to the main house, in case the kitchen or sheds were on fire. The fronts of the houses should face each other. We should then have alternately a front and back street. This would be a convenience, as the front streets would be exempt from some things which are disagreeable.

With respect to mechanics' shops, these should be built, and stand unconnected with dwelling houses. Much economy would result from this. A number of mechanics having shops near each other, might unite in the employment of a steam engine, to drive lathes and other machinery. If the various branches were carried on in the vicinity of each other, much time might be saved, both to the mechanics and their customers. Several mechanic locations might be distributed in different parts of the town.

The plan of the streets is of much consequence in finding a fire, when an alarm is given. I was once struck with the admirable plan of a spiders's web. The animal keeping watch in the centre, how easy it was for him to start in any direction, that an unlucky fly might get entangled in his net. I thought at the time, this would be an excellent plan for the streets of a town; with a watch tower in the centre, and a depot for fire engines, together with a market and other establishments requiring a central situation. Every district might also have its fire engine. By keeping a good look-out of a night, the direction of a fire might be quickly ascertained; and an index that swivelled round might point towards the fire. It might be elevated or depressed to indicate whether the fire was increasing or diminishing, or the town might be divided into sections, and the number of the section, where the fire was, presented alternately to all the radiating streets; so that any person wishing to know the location of a fire, would have but a short distance to walk to get at one of these streets, and but little time to wait if the index was kept revolving before he could satisfy himself.

Having thought considerable on this subject, I can conceive of some difficulties, and there are many arguments in its favor, which I may give at some other time. Perhaps some of the correspondents of the Young Mechanic will favor me with their objections.

PHILO.

MEMOIR OF A MECHANIC.

[Continued from page 120.]

I MENTIONED that my father could neither read nor write. He was very fond, however, of hearing all his children read; indeed, he made it a practice to hear us read the scriptures after dinner every Sunday. He sometimes had letters to write, most of which during my apprenticeship fell to my lot. At first he used to dictate what he wished to have written; afterwards he only gave me a general

idea of what he wanted; and left the rest to my discretion. The neighbors would occasionally get me to write for them. This gave me confidence; so that, although a bad writer to this day, I have not been very diffident at putting anything with which I was acquainted on paper. I feel more than ever the benefits of thus early attempting to write short epistles, or essays. Having some acquaintance with the periodical press; I know the difficulty of getting young men, not only among mechanics, but in all classes, to communicate what they know. They have leisure enough, but the task is too hard, because they have never been used to it. I had considerable patience with any thing that I undertook willingly. For instance, my father borrowed a book containing two sermons, a prayer, and some other short pieces. He was very fond of it, and did not know how to get a copy. I offered to write a copy of it, if he would find the paper. This occupied my leisure time for several weeks, but I finished it in spite of the jokes of my companions, for it was no easy matter to turn me from any thing I had set my mind upon.

I had some taste for drawing but found it difficult to make much progress, situated as I was. Gandy pictures were much more easily made than correct representations; however, by perseverance and having a better chance as I grew older, I succeeded in mechanical drawing to my wishes; and also, tolerably well in the ornamental department.

From what has been said it might be thought, that I had always business enough on hand to keep me from mischief. I have sometimes, however, engaged in the excesses common among young men; but soon there would be something disagreeable happen; when I would return to my more innocent, as well as more profitable amusements. I used to be glad when a holiday occurred, for then I could do more than in many evenings. Thus, my seven years apprenticeship passed away. I served my time out 'duly and truly,' and my master gave me ten pounds with my indenture. He asked me what I was going to do. I told him I was going to London. 'Well,' said he, shaking my hand, 'Keep your right hand forward, and you will do well.' I had been vaccinated with the kine pox for the occasion, as a preventative against the small pox.

I arrived in London in April, 1810. Here many new scenes were presented to my view. In such a place, among so great a variety, it is difficult to confine oneself to what is most beneficial. My habits were fixed, however, and I adhered to my former plans. It should be understood, that I had been bred up in a part of the country, where agriculture is the chief employment of the people; that I had seen very little of manufacturing, or of machinery; in fact, I had never seen a steam engine, or heard a lecture on any branch of science, or seen a book on any subject connected with the arts or sciences, except one on Geography borrowed for a short time. Such was my situation when I visited the metropolis. I obtained work immediately; and here I may observe, that to this day, I

have never been without regular employment, except when I travelled for my own pleasure; nor even then, but for short periods. It was nearly two years before I adopted any regular system of passing my leisure time; most of which was spent in visiting places of note, or objects of curiosity. About this time I procured a good lathe, and other tools, and also a wife to assist me.

Having now a home where I could amuse myself in my own way, I pursued from this time a regular course; sometimes making various mechanical contrivances—at other times I practiced drawing. The latter is very good amusement for a young mechanic. It helps him to understand what he reads, as the engravings in books become easy to his comprehension; it also habituates him to nice observation, assists his memory, and is the cheapest amusement that I am acquainted with. It makes very little noise or dirt, and by having things portable they may be got out or packed away in a short time. Drawing is more or less useful to all, and is essential to the successful practice of some trades.

I was employed in a large machine shop, among men from various parts of the country. In such a place many valuable ideas may be picked up, but great care is necessary; for there are so many erroneous notions prevailing among workmen generally, that a young man may easily be led astray. An error among many of them was, a belief in the possibility of finding out the perpetual motion, or self-moving machine. I was for some time laboring under this delusion, and spent much time in the pursuit of what I am now perfectly satisfied cannot be accomplished. My first attempt was to make the descending side of a wheel heavier than the ascending side, by causing moveable parts to approach and recede from its centre; but let me modify it how I would, there always were a greater number of those moveable parts on the ascending side; so that, although they were made to recede further from the centre after passing the top, they were fewer in number on the descending side, and the wheel would turn as well backwards as forwards. Many other methods were tried, and some of them with fluid matter. A syphon was made with the short leg much larger than the long one, that it might contain a greater weight of water, and over balance that in the long leg; but I found it was necessary that the discharging end should be lower than the surface of the water in the vessel, whatever might be the form of the syphon. To detail all the experiments made would occupy too much space; the above are selected as fair specimens.

I can hardly tell whether the following whim of mine is worth relating. A young man made a box trap for catching mice, and was showing it as a specimen of his ingenuity. 'Now,' said I, 'if you had made it so, that after the mouse was caught, he would set the trap ready for another, and then go and drown himself, it would have been worth something.' He exclaimed, 'That is impossible! that is more than you can do.' I told him I would produce one in a fortnight's time. And so I did; and after that

another more simple than the first. These mousetraps were pronounced to be the greatest curiosities in my collection, which was coniderable. The first trap consisted of a box, open at one end, and a wire grating at the other. When the mouse entered the trap, and began nibbling the cheese, the door at which he entered would fall down. There was a hole in the side of the box, on pushing his way through which he raised the end of a lever, and started some clock-work placed on the top of the box, by which the trap was set again; while the noise of the wheels so startled the little fellow, that he would run up inside a spiral wire tube, into a jar of water before he was aware of it. In the second trap, instead of the clock-work, it was set again by the mouse turning a hollow wheel like a squirrel cage. It was so contrived that after entering this wheel, he must either work or stop there, but the instant he set the trap, a little door opened on one side of the wheel, when he would escape from it, to be let down by a trap door into the water.

I have now arrived at what I consider the most important period of my life. Up to this time, I had no instruction (after leaving school,) but what I could get in a very uncertain and precarious manner; and was just turned of twenty-five years of age, when I happened to see a notice of a course of lectures on Natural Philosophy and Chemistry. The names of the subjects to be treated on, such as Pneumatics, Hydrodynimics, Arostation, &c. were all Latin to me. On further examination, I found under the various heads, some account of the experiments illustrative of engines, and other things that I wished to be acquainted with. I bought a ticket, and was so pleased the first time; that I took notes of the lecture, and some sketches of the apparatus, (for I was seldom without my pocket book and pencil.) On returning home, I sat up very late, to write all that I could remember of the lecture. I continued to attend these lectures weekly from October 1815 to April following, taking notes of all that was of importance to me. In the following summer I procured a book on Natural Philosophy, which contained an account of the various things I had seen in the lectures. I also made many articles with which I tried experiments; and succeeded so well as to be induced to attend a second course of lectures, besides several others given by different persons. At length I applied for membership to a Philosophical society, but not having friends enough at court I was not received. This did not turn me aside from my pursuit, but stimulated me to use all my efforts to improve the class to which I belong. No! it made me redouble my exertions, I reasoned thus: I am a mechanic—that is the difficulty. Well! suppose the mechanics should be invited to form themselves into a society for mutual improvement. This was suggested to a few persons, and with their approbation I got a circular printed, and distributed it, inviting those who felt the want o information to come forward. A society was formed, which lasted about three years, and finally dwindled away; leaving the few persons who began it in

possession of what books and apparatus had been procured. It is astonishing, but it is true, that the great mass of mechanics do not appreciate knowledge as they ought to do; they do not go forward themselves, and can hardly be persuaded to partake of the repast after every thing is prepared for them; so that it becomes those who have drunk at the fountain of knowledge, and known its efficacy, to go forward and do all they can for its general diffusion; for there is nothing that we could do, that would have so great a tendency to alleviate the miseries that are felt by the great bulk of mankind.

(To be continued.)

PORTLAND MECHANICS' LYCEUM.

In the latter part of 1828, a few young men, apprentices, incidentally met, and during their conversation, remarked upon the utility of improving the intellect; and before parting, it was thought best, if a convenient room could be obtained, to form a class and commence studying some one of the most useful branches of education. For some time this object laid in suspense, and nothing was done but talking. At length one suggested the idea of forming a society of young Mechanics, for the purpose of mental improvement, to have connected with it a Library, who drew up a preamble, with some regulations. These were submitted to the rest, who approved of the measure, and were willing to engage in the undertaking.

The preamble and regulations thus drawn up, being rather defective, all heads were set to work for the purpose of making something that would better answer the end in view, and which would be more likely to engage the attention of those for which the society was designed. About a dozen were written, each at different intervals, till at length one was produced which appeared to answer, and which briefly set forth the objects intended. So much writing and talking necessarily retarded its progress, and it was not until the latter part of March, 1829, that the preamble was fully accomplished and ready for subscribers.

On Saturday, March 31, 1829, an apprentice having had his stent and gained the afternoon, took the paper, and volunteered his services to go to the work shops in town and inform the younger class of mechanics of the meeting intended to be held that evening. He also invited those who seemed interested, to sign the preamble. The result was, that at night the list numbered forty-four, mostly apprentices, none advanced of 25. The meeting that evening was large and respectable. The business was transacted with the strictest decorum. The most important was that of choosing a committee to draft a Constitution and By-laws, to effect the objects laid down in the preamble, which were, the acquisition of knowledge and the promotion of temperance, together

with the forming of a library. This latter clause occasioned the appointment of another committee, who were to report the best possible means whereby one might be established.

The committees thus raised were faithful to their trust. A very good Constitution was adopted, with a respectable code of By-laws. The Society then took the name of Franklin Association. The report of the Library committee, among other things, recommended the appointing of a committee to wait on the Maine Charitable Mechanic Association, to procure, if possible, the loan of the Apprentices' Library. This committee was raised, and did the duty assigned them; the result was favorable, and the loan obtained, a proviso being made, that while it should be in the hands of the new society, it should be well taken care of, and that the Library room should be opened on Saturday evenings for the loaning and the receiving of books. The Mechanic Association manifested much interest in the new society, and reposed great confidence in it. They also liberally voted to expend the sum of twenty dollars annually for additional books. This Library at present numbers about 1400 volumes, and has continued in the hands of the Lyceum ever since.

At the formation of the society, each person, agreeably to the Constitution, on signing it, was obliged to present the society with at least one bound book, to be approved of by the Directors. This course has been followed to the present time. Besides the books given by members, some of the funds of the Lyceum have been appropriated for more valuable works.

Towards the close of the first year of the existence of this Society, it nearly fell into oblivion. The meetings for transacting the most important business were rarely attended by more than a dozen members, and but one or two of the objects for which the society was formed had as yet been accomplished. It was therefore found necessary by the few most interested, to do something without delay to revive it.

A very judicious course was adopted. A member was appointed to deliver an Address on the annual meeting, which was near at hand; public notice of which was given through the newspapers. This meeting was well attended. Both sexes were present. The Address was much to the purpose, and well calculated to instil new life and energy into the members. After the Address, the clergyman who was invited as chaplain, rose and addressed the members of the society in a very appropriate and encouraging manner. The audience then retired, and the society proceeded to business, of which some of importance was transacted; such as adopting a new Constitution and By-laws, and the raising of a committee to take into consideration some of the measures recommended in the Address. This committee reported at a subsequent adjourned meeting, in favor of forming within the Association a school for mutual instruction, in which, for the present, only writing and grammar should be taught, and of each member having the privilege of introducing a female friend. This report

was accepted, and the school was soon formed and put in operation; and at various periods afterwards, different studies were pursued. Soon after the annual address several influential and persevering mechanics joined the society, who did considerable for its advancement; and from that time to the present year the societyhas been flourishing.

The school continued until early in the spring of this year, when by a vote of the society it was suspended. While the school was in operation much improvement was made by the scholars, and much advantage reaped by the members.

Shortly after the organization of the school, one evening in the week was devoted to reading and debates; and at a more subsequent period an evening in the week was allotted to declamation, and at a still more recent period, a Court was established in the Lyceum for trying members for any misconduct of which they might have been guilty. During the whole period since the formation of the school, the society has had occasional addresses by different members, on quarterly meetings, agreeably to a proviso in the Constitution.

In December, 1830, a third Constitution and code of By-laws were adopted, in substance the same as the former two, but more preferble, and the name of MECHANICS' LYCEUM in lieu of Franklin Association adopted. This name was thought to convey more strictly the objects of the society than the other.

During the winter and spring of 1831, a course of lectures on Natural Philosophy was delivered before the Lyceum by several of its members. This course embraced the general topics of that science, as usually laid down in works treating upon it. The lectures were well attended, and fraught with much instruction.

At the commencement of the spring of the present year, the Lyceum took a vote to invite several professional men to lecture before them on scientific subjects. These lectures were delivered on Tuesday evenings of each week throughout the spring; and during the course some of the members also rendered their services by occasional lecturing. Considerable interest was manifested in this course; the lectures were well attended both by members and citizens. On some occasions, the house was filled to overflowing.

Since the above course terminated, the Lyceum took a vote to suspend the school, lectures, and meetings for debate and declamation, until the latter part of this month; and the Board only is now in operation, which consists of the President, Secretary and six Directors, who hold meetings on Saturday evenings at the Library room, after the business of the library is finished. The board of Directors, exclusive of the President and Secretary, is elected by ballot quarterly; they act as librarians. The President and Secretary are chosen annually. The whole Board transact the minor business of the society, such as the admitting mechanics as members, &c. They also compose a vigilant committee, to see if any member is guilty of any misconduct, or of violating any of the

regulations of the Lyceum. It is their duty also to select subjects for debate, when questions are to be discussed, and to appoint disputants; to appoint persons to speak pieces or read; in fact they have a general superintendence of the affairs of the Lyceum.

It is expected that early this fall, the Lyceum will again resume her wonted station—that the various departments which, since its existence, have been the instruments of diffusing so much useful information among the mechanics of this place, will be opened and entered upon with increasing energy. I trust, that as years shall roll onward, that class of society which the name of this institution designates, will, by their exertions, by improving their intellects and storing their minds with useful knowledge, rise from that state in which their own negligences have hitherto placed them, to a level with the most erudite and influential of the community.

S. H. C.

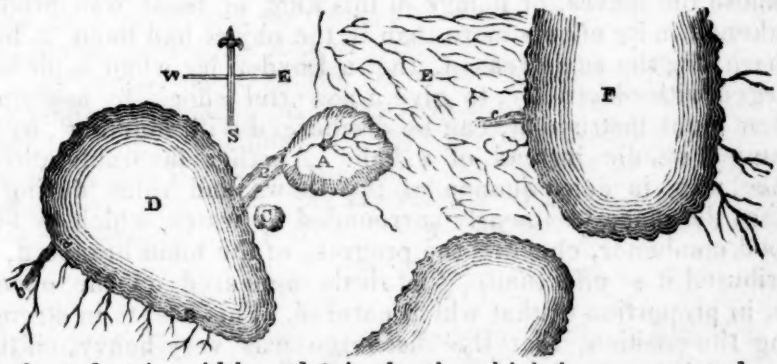
LIGHTNING.

Messrs. Editors—While on a recent visit to Stoughton, I was shown among the curiosities of the place, one which I conceived would be acceptable to your readers, if a description could be given, at all commensurate, to the sublimity of the subject. It was the effects of one of those terrible discharges of electric fluid, which are seldom witnessed, and more unfrequently described. Although it is impossible for me to convey an adequate idea of the scene, yet some things connected with it, are so peculiarly interesting, that I cannot forbear to make the attempt. For the following description of the storm, I am greatly indebted to a friend who witnessed this grand but awful display of electric phenomena, and accompanied me over the place, pointing out the different courses which the fluid had taken, many of which were still visible, and aiding me inmaking the following sketch, which although imperfect, is sufficiently correct, to give the reader a better idea of its location, than could be given by writing alone.

On a sultry day, during the last spring, about 4 o'clock, P. M. the clouds began to rise extremely black and threatening, and shortly afterwards drove about in great confusion, from south west to north east, presenting appearances which have seldom, if ever before been witnessed by the oldest inhabitants of the town. In consequence of the increasing darkness, mechanics and farmers were unable to follow their business, and collected in groups, awaiting in suspense the product of the next moment. The clouds still gathered, and grew more dark and heavy, till at length two clouds from opposite points came in contact, and lightning was seen in every direction, succeeded by the most appalling claps of thunder; immediately afterwards another more dreadful than the first burst forth, and the atmosphere appeared to be filled with

balls of fire, which burst, making a hissing, like that of a hot ball thrown into water, accompanied with a report like a pistol.

Soon after the storm, it was reported that the lightning had struck near; my friend among others repaired to the spot, which was in the woods about a quarter of a mile from any house, and the scene which he describes was truly desolating. The fluid appears to have struck a large pine tree about 60 feet in height, situated in the seam of a ledge of granite A, which rises about 8 feet from the surrounding surface of the ground. The branches were entirely stripped from the S. W. side of the tree by the fluid, in its descent to the rock, where it separated into nine branches, each taking a different direction, breaking off pieces from the ledge in their courses, and throwing them about in every direction, some weighing several hundred pounds. The principal branch running south westerly, after leaving the rock entered the ground, forming a channel in its course more than four rods in



length, 8 feet in width and 7 in depth, which is represented at B. The earth from the channel was thrown up with great force, almost covering the surrounding trees for several rods. One tree about three inches in diameter (which grew where the channel was made) was thrown 25 feet high, and lodged in the top of a larger one, where it is still to be seen. c is a large rock 3 feet in diameter, which was also thrown from the channel several yards, smaller stones and branches of trees were thrown two or three hundred rods. Its course was then interrupted by the water D, through which it went to the opposite side, and appeared in nine different places, making another channel at *a*, six feet in length, and one in depth. It then entered the ground obliquely and disappeared at *b*, leaving a hole five or six inches in diameter. The other branches, after spreading for some distance, as represented in the sketch, likewise disappeared.

The other primary streams, which started from the rock, continued their course in a north easterly direction, and spread over the field E, of about 15 acres, covering the surface with small channels branching in every direction. Here also meeting with the water F, it appeared to collect in two places at the edge, making (as if in fury at this interruption to its course) the channel *c* five feet in length, one in width, and two in depth, and then

bounded into the earth, leaving another hole similar to *b*. The remainder crossed the water and came out on the opposite side in three places, then branched into smaller channels, until it entirely disappeared.

I have thus confined myself to a simple and plain description, feeling conscious that to add to the grandeur of the subject, is beyond the power of words. Without entering more largely into the subject, or engrossing more of the patience of your readers, I will conclude, by merely giving one or two ideas which occurred to me while examining the situation of the place. There is no doubt, but that the discharge of fluid was very great, and would have produced incalculable destruction in a thick settled village. But Providence, ever watchful with an overruling hand, appeared to direct it to a very peculiar and favorable spot. The tree was pine and situated higher than any other in the neighborhood, and the fluid (being received among the innumerable points which compose the leaves, or foliage of this kind of tree) was probably weakened in its effects more than if the object had been a house or barn; for the same reason, that a Leyden jar when sufficiently charged with electricity, to give a powerful shock by applying a ball or blunt instrument, can be discharged with impunity, by presenting a needle instead of a ball. Another favorable circumstance was, in consequence of the thaws and rains during the spring, the place was nearly surrounded by water, which by being a good conductor, checked the progress of the main branch B, and distributed it so effectually, that little appeared on the opposite side, in proportion to that which entered. This assists in strengthening the position, that the discharge was very heavy, (if there was an absence of other proof) for the water D covered two acres, and yet was insufficient to prevent some of the fluid reaching the other side. I have no doubt, however, if the water had been deep, it would have been entirely checked.

The above is in the N. E. part of Stoughton, and extends about a quarter of a mile. J. M. W.

PATENTS FOR MASSACHUSETTS.

GRANTED IN FEBRUARY AND MARCH, 1832.

February.

For an improvement in the mode of *Cutting out Visors of Leather, and other materials, for Caps and Hats;* John Hoskins, Roxbury, Massachusetts, February 20.

For a *Cane Rifle;* being an improvement on rifles and guns. Roger Newton Lambert, Repton, Massachusetts, Febuary 27.

March.

For an improvement in *Harness Saddle Trees.* Philo Washburn, Bristol county, Massachusetts, March 8.

This saddle tree is to be made entirely of wrought iron. In

the middle, where it is fitted to the ridge of the horse's back, it is to be made quite narrow, whilst the sides are widened and flattened out. The terrets and water hook screw into holes prepared for them, and the tree, when properly padded, is complete. The claim is to the wrought iron tree, as a substitute for wood, it being more compact and stronger than that material.

For an improvement in the *Manner of supplying Steam Boilers.* Jesse Fox, Lowell, Massachusetts, March 14.

For *Machinery for Printing.* John Hatch, Boston, Massachusetts, March 21.

This is a new contribution to the list of power presses, the introduction of which has done so much in facilitating the typographic art. In a complex machine of this description, the parts are too numerous, and the peculiar combination which constitutes the essential characteristics of a new or improved machine, too dependent upon minute points to admit of their being given without drawings. To such particulars the claims made by the present patentee refer, and we therefore dismiss the subject, at present, without an attempt at description.

For an improvement in the *Mode of Spinning Wool*, for the manufacture of coarse or heavy fabrics, and particularly for ingrain carpeting. William Calvert, Royal Southwick, and Alfred Messinger, Lowell, Massachusetts. The former an alien, having resided here two years; the two latter citizens of the United States. March 31. *Journal of Franklin Institute.*

PROCESS OF MM. THENARD AND DARCET,

FOR PRESERVING SUBSTANCES FROM HUMIDITY.

In a former number of the Young Mechanic, our correspondent J. M. W. inquires whether there is any simple but effectual means of preventing damp walls. Perhaps the following from the Franklin Journal will answer his purpose. EDS.

On the 27th of February, 1824, there was read at the Academy of sciences of Paris, a memoir, by MM. Thenard and Darcet, on the employment of fatty bodies, for making coverings and unalterable plasters, and for making moist places salubrious. This process, the effects of which have been established by several years experience, consist in causing a mixture of one part of oil, and two parts of resin, to penetrate, by means of an intense heat, either porous stones, or plaster. The bodies penetrated with this mixture, acquire afterwards a singular degree of solidity, and become absolutely impermeable to moisture.

This process may be employed, for rendering low and damp places salubrious. It was tried at the Sorbonne, and the expense of it was only 16 sous per square metre, or a square whose side is 29 English inches. The other objects, to which it is proposed to apply it, are houses, statues placed in the open air, bas reliefs and sculptures in plaster, the ceilings and walls of rooms intended for Fresco paintings, basins for holding water, and reservoirs for holding grain.

M. Thenard exhibited to the Academy, several objects of art, executed in plaster by his process. In order to show its efficacy, he exposed to the open air, for several years, a bas relief, half of which was formed of ordinary plaster, whilst the other half was prepared. This last half was perfectly preserved, while the other displayed visible traces of disintegration. This process does not resemble those which consist in covering bodies with a sort of skin, which keeps off humidity. The body is actually penetrated with the mixture, to the depth, sometimes, of several inches.

THE BEST METHOD OF PREPARING GLUE.

In the purchase of glue, it would be well to select it in warm, damp weather, for then if the oily substance has not been thoroughly separated in its manufacture, it will be soft like India rubber. This will neither dry nor hold well, and after being melted, will in a short time turn black and taint. The method I have adopted for improving glue, is to add a gill of vinegar, alcohol, or cider, when dissolving it in a common glue pot, and afterwards, as much water as necessary. Glue prepared in this way, will melt much quicker and hold the heat longer, than in the common method, and when used on wood, will dry much better and will not taint. The vinegar I think is best, as it does not evaporate so rapidly as alcohol.

JOSEPH.

ANSWER.

Messrs. Editors—In answer to a question in the Young Mechanic 'Can any means be used to put thin sheet lead on roofs so as to prevent cracking?' I would say, there can. As a proof, I refer to a roof at the Lead works, Roxbury. The lead is 3 to 3 1-2 lbs. per foot. It was done March, 1831, without nails or solder. Being brought up in England to the use and manufacture of sheet lead and pipes, I profess to know the nature of the metal, and feel confident of its use, to answer the end required. Had I the means, I could manufacture sheet lead, in a way that would remove the doubts of the most captious, as to its durability. In the question is the expression 'This changeable climate.' True it is so; but let allowance accordingly be made, for contraction and expansion; and knowing the medium and different temperatures we have to contend with the difficulty is obviated.

J. B. P.

QUESTION.

If two wheels be geared together, the larger having 127 cogs, and the smaller 21 cogs, it is required the number of revolutions of each wheel, before the same two cogs meet again.

JOSEPH.